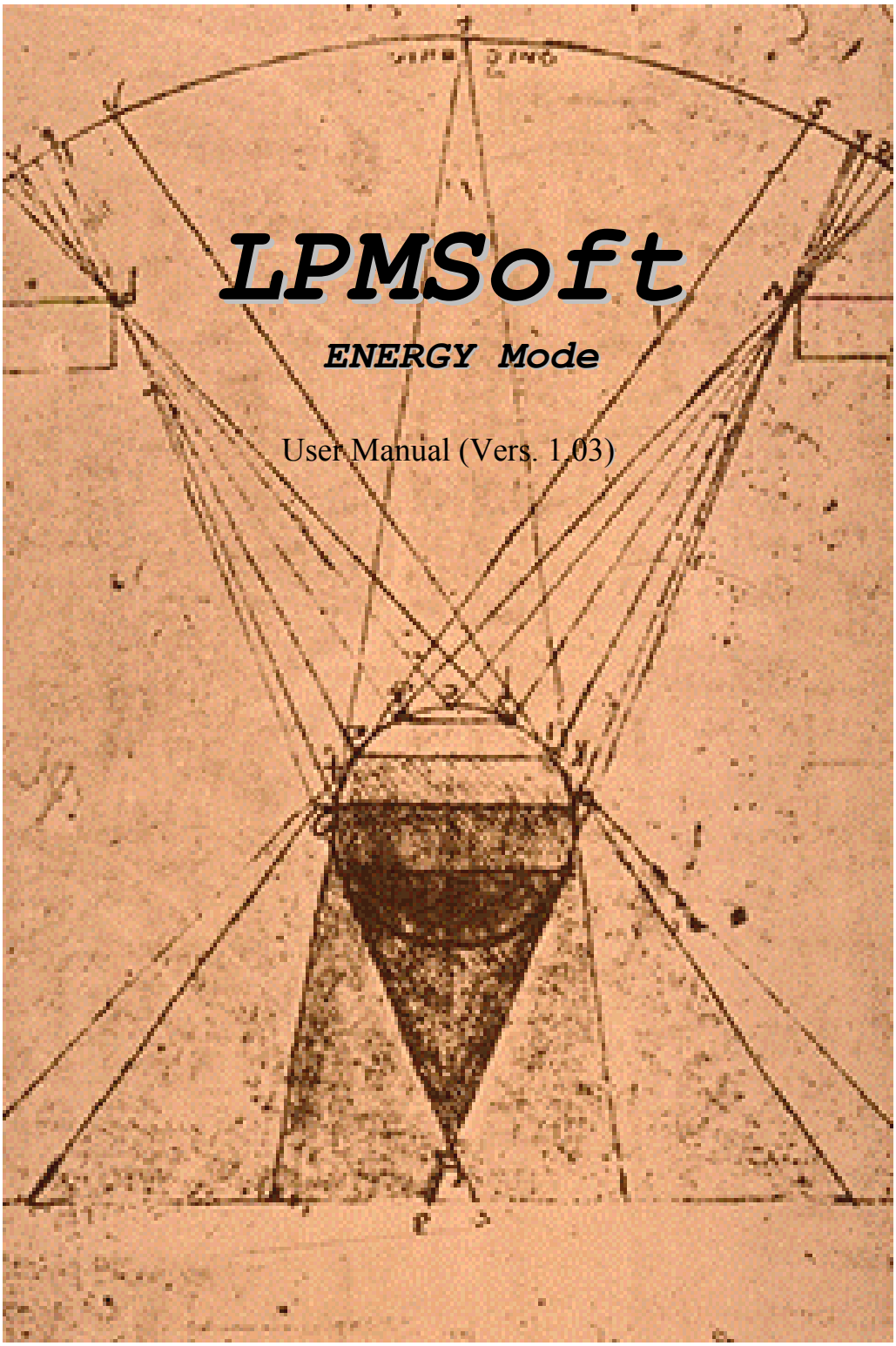

LPMSoft

ENERGY Mode

User Manual (Vers. 1.03)

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Contents

CONTENTS **2**

1. LPMSOFT INSTALLATION **3**

2. SWITCH-ON PROCEDURE **4**

2.1 LPM Monitor to PC Connection 4

2.2 Starting sequence 4

3. STARTING WINDOW **4**

4. ENERGY WINDOW **5**

4.1 Handling of Measurements 5

4.2 Handling of Process Parameters 5

4.3 Handling of Screen Histogram 6

5. MEASUREMENT PROCEDURES **7**

6. SAVE MEASUREMENT ON FILE PROCEDURE **8**

7. OVERFLOW **9**

8. COOL **9**

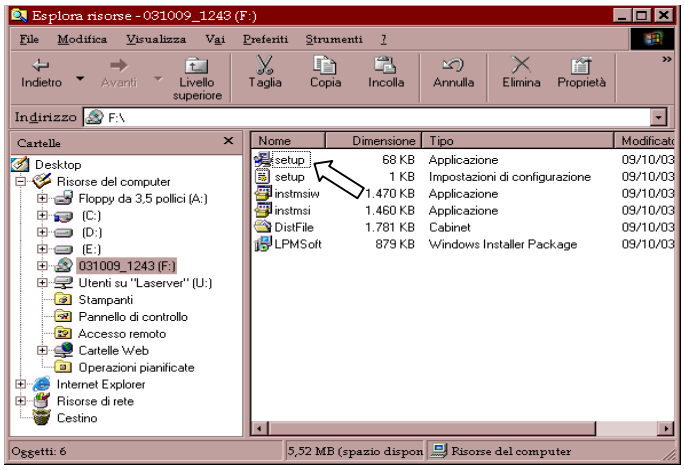
9. ERROR CONDITIONS **10**

10. SAFETY **11**

1. LPMSoft Installation

Your LPMSoft Energy Mode handles the LPM monitor acquisition electronics when working in Energy Mode.
Contact LaserPoint for further information on the LPMSoft for the Power Meter and FIT Measurement Modes.

If a previous version of the LPM software is installed in your PC, uninstall it using *Application Installation (*from the *Start* menu*, Settings, Control panel)*.



Insert the CD in your PC; open the CD folder with *My Computer* and left click the mouse to start the Application *Setup* . Follow the installation program instructions.

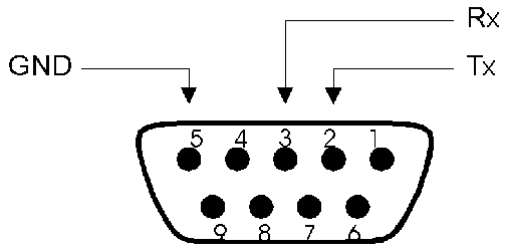
Note: the best screen resolution is 600x800

2. Switch-On Procedure

2.1 LPM Monitor to PC Connection

Connect the LPM electronics to the host PC device by a 9-pin, straight through, RS-232 cable with male connector on LPM end and female connector on the PC end.

The pin assignment on the LPM side is shown on the drawing:



2.2 Starting sequence

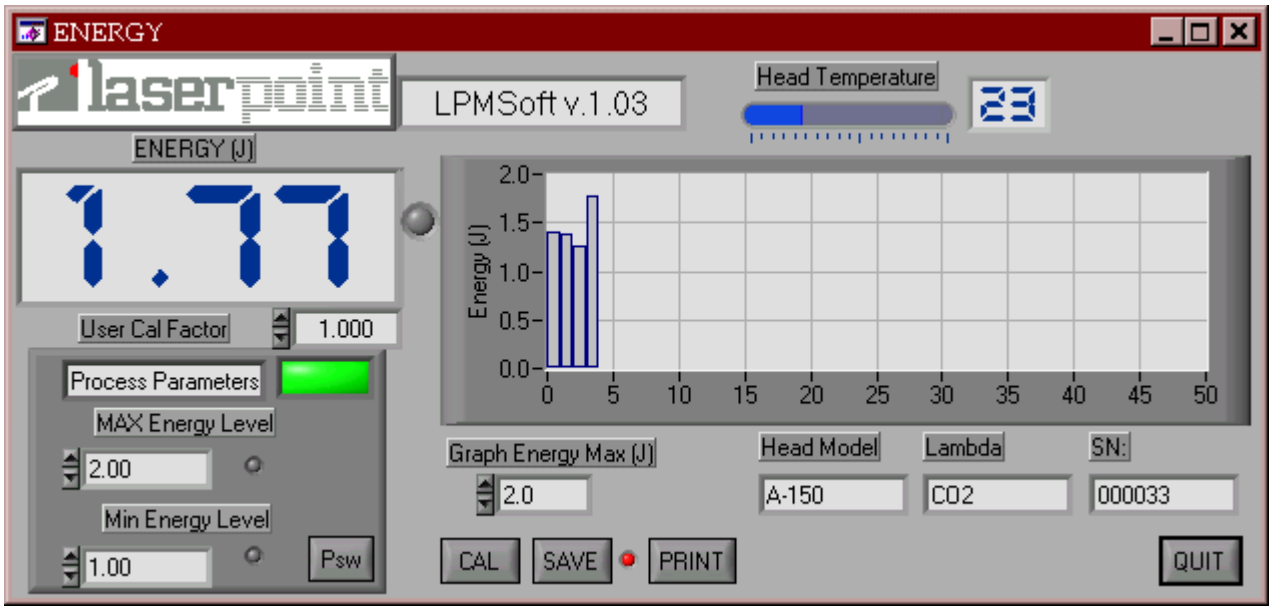
1) Switch on the LPM Monitor following the procedures described within its Instruction Manual.
2) From the same folder used to install the LPMSoft, run the Application LPMSoft.exe.

3. STARTING WINDOW

When starting the program select the serial RS-232 ports COM1-4 used for the connection; the selected COM is stored in the SetUp file.

Quit: to exit the program
COM Selection: select the serial ports COM1-4 used for connection and press Enter
Start: to enter and run the Energy window.

4. ENERGY WINDOW



4.1 Handling of Measurements

HeadModel: shows the detector head model in use
Lambda: shows the detector's calibration wavelength
SN: shows the head serial number
ENERGY (J/mJ): shows the measured energy value
User Cal Factor: this number will multiply to the actual measured value to calculate the corrected value. For example, if you are measuring the laser beam passing through the 99.9% back reflector of a laser (giving 1/1000th of the real value), enter 1000 in the dialog box. The LPMSoft will display the laser's energy rather than the measured 0.1%.
Head Temperature (°C): shows the temperature on those heads provided with temp. sensor
CAL: accomplishes an automatic Zeroing (refer to the LPM User Manual)
SAVE: Enables the automatic function save measurements on file; this function is active when the Led is green.
PRINT: print on connected printer the Energy Window
QUIT: leaves the program

4.2 Handling of Process Parameters

It is possible to monitor if the measured energy remains within two pre-established (Min/MAX) limits. This feature extends the LPM applicability to rigorous energy control and monitoring, necessary in many processes.
Process Parameters: when the measured energy is within the pre-established limits, the rectangular Led is green; when outside is red. The round Led red indicates the limit overtaken.
MAX/Min Energy Level: set process thresholds; for safety those are protected by password (factory set laserpoint). Insert the desired threshold value (Max. 13000) and press Enter; if the Min value< Max value condition is satisfied, the threshold value is displayed and stored in the SetUp file.
Psw: left click with the mouse to change the Password used to protect *MAX/Min Energy Level* and *User Cal Factor*. The Password window is displayed; insert old (factory set laserpoint) and new password, press Enter to confirm.

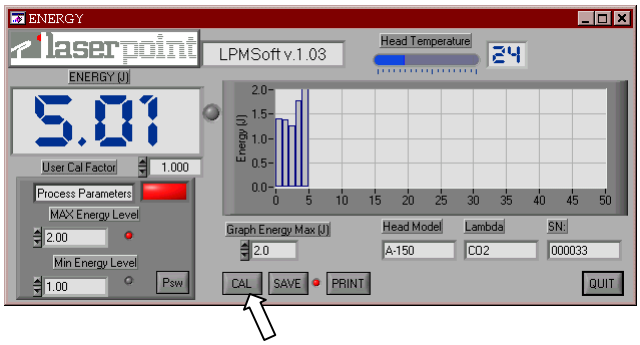
4.3 Handling of Screen Histogram

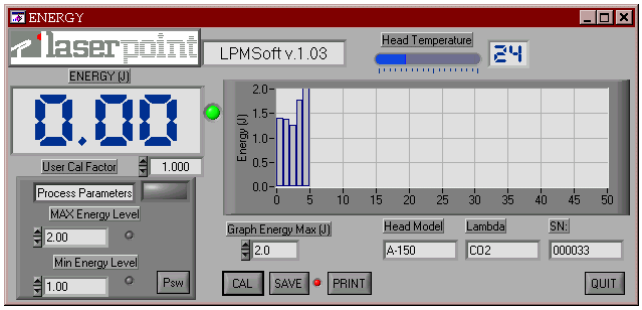
The histogram on the screen displays the measured energy (blue lines) vs the number of measurements done.

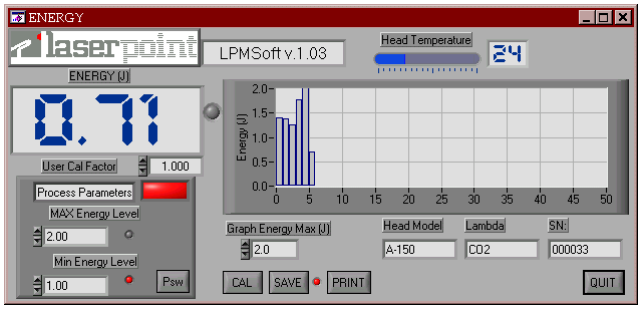
Graph Energy Max (J): sets the Energy axis on the energy histogram. Insert the desired full scale and press Enter: measured values will be automatically scaled.

5. Measurement Procedures

1. If needed, set the MAX and Min process thresholds, by means of *MAX/Min Energy Level*.
2. If a successive measurement has to be stored, refer to the section 6. Save on File Procedures







3. Verify that all safety conditions are satisfied; refer to section 13. Safety

4. Left click with the mouse on the *CAL* key or use *Digital Input 1* on LPM to arm the measure. The *ENERGY (J/mJ)* display will zero, the display's Led will light green, and the *Process Parameters* Leds switches off.

5. Verify that no laser beam or other spurious radiation is striking on the detector; align the measurement head to the optical path and open the laser (in single shot configuration) shutter. Verify that only the sensor surface is intercepting the laser beam .

6. The display's Led will blink green during the measurement for few seconds (measurement time depends on the detector head model).

7. As soon as the display's Led will light red the measurement is terminated. Close the shutter and turn off the laser. The measured energy value will be shown on the numerical display *ENERGY(J/mJ)* and the plot will report the energy behaviour vs time. The Process Parameters Leds will light green when energy is within thresholds, red when energy is not.

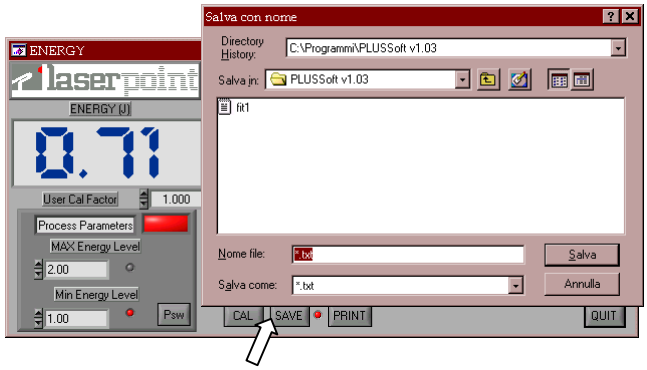
8. A new measurement could be made once the display's Led will switch off (waiting time is from 5 to 25 sec. and depends on the detector head model).

NOTE: In order to avoid thermal overloads to the detector head, LaserPoint suggest, to not exceed a limit temperature of 80-82°C.

NOTE: wait the end of the measurement to perform other SW function (for ex. Save, handling of process parameters, handling of Power Graph settings, etc.)

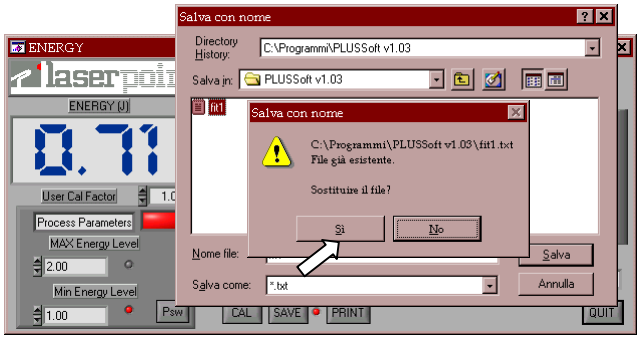
6. Save Measurement on File Procedure

Whenever measurement data need to be saved on files, the *SAVE* function must be enabled first, following the described procedure. The Led accompanying the *SAVE* key, when green, shows that this function is active.

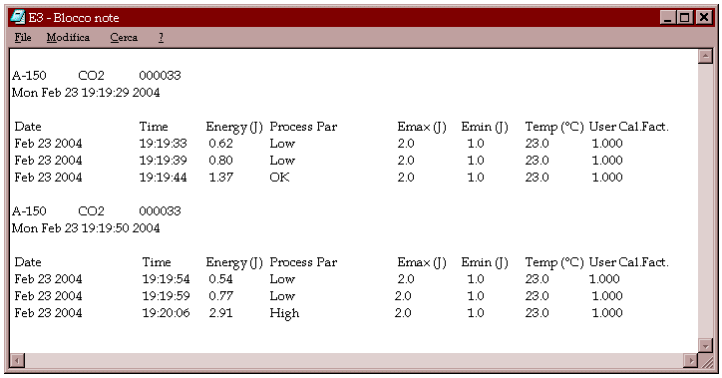


1. Left click on *SAVE* with the mouse.
2. Select the folder on the *Save As* window and insert the file name. The Led will turn green. At the end of each measurement the power value will be automatically saved
3. To disable the Save function click on the *SAVE* key; the Led turns red.

Note: verify that the selected file is not already open on your PC during measurement.



In case new measurements have to be saved on an existing file, without deleting stored data, confirm the substitution of file by left clicking with the mouse on the *Yes* key.

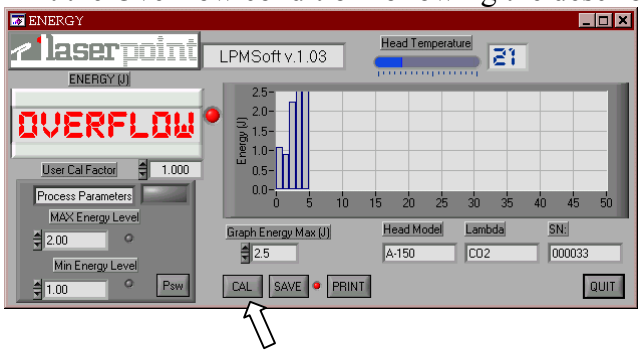


The structure of saved file (.txt format), shown in the picture is:
- headline, reporting head model, calibration wavelength, serial number, date and starting time of save
- eight columns reporting date and time of savings, measured energy values, process conditions, process thresholds, Head temperature, and user calibration factor.

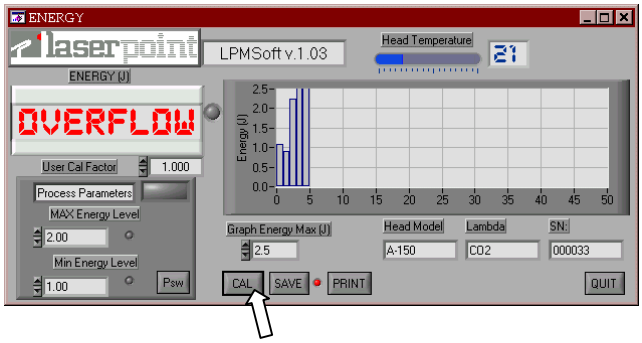
Note: It is also possible to import the saved file in a spreadsheet (e.g. Excel); use Excel to open the text file importing data and use tab as data limiter.
Don't modify the .txt file to preserve, for future measurements, both its structure and correct functioning.

7. Overflow

All times the measurement head will undergo to energy levels above its full scale, an OVERFLOW alarm is displayed and the display's Led will light red. Refer to the LPM Monitor User's Manual for more information.
Exit the Overflow condition following the described procedure.



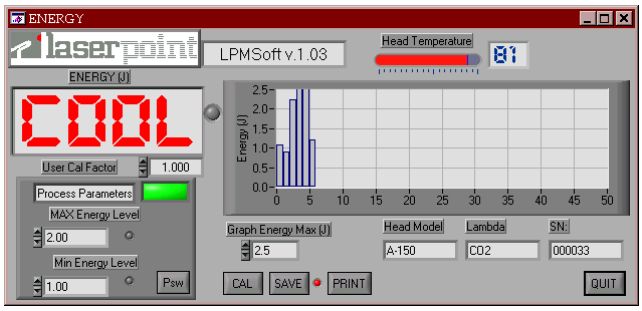
1. Close the shutter and switch off the laser. Wait 25 sec. to allow the detector head to reach a new thermal equilibrium. Left click on *CAL* with the mouse, or use *Digital Input 1* on LPM to switch off the display's Led.



2. Left click on *CAL* with the mouse, or use *Digital Input 1* on LPM. The display will zeroes and the LPM will be ready for a new measurement; please refer to the paragraph 5.Measurement Procedures

Note: When the saving function is enabled, the OVERFLOW alarm will be displayed in the Process Parameter column.

8. Cool



Whenever the temperature of the detector head is above its limit, this will be displayed as a *COOL* alarm (red).
In this cases, switch the laser off and cool the head taking care not to contaminate the absorbing surface.
Note: occasional dirt or contamination of absorbing surfaces may compromise system performance both regarding damage thresholds and measurement precision.

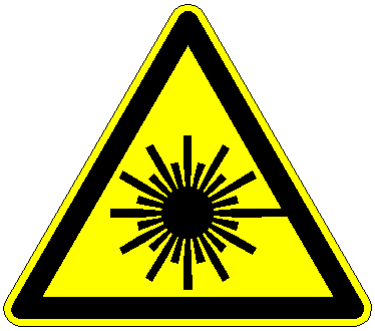
9. ERROR CONDITIONS

Whenever an error condition in the Software is detected, a window claiming the error is displayed.
The meaning of error windows and how to solve the related problems are displayed in the following table.
In any case, by left clicking the mouse on OK the program will be terminated.

Error Window	**Conditions**	**Solutions**
RS-232 COMMUNICATION ERROR	No communication between LPM and PC.	Check if the selected COM is correct one; Check the cable connecting LPM to PC; Check connection between LPM and measurement head; Check the LPM electrical supply.
RS-232 COMMUNICATION ERROR	Communication between LPM and PC is interrupted during operation.	Check the connection cable between LPM and PC; Check the LPM electrical supply .
DETECTOR HEAD ERROR	Communication between measurement head and LPM is interrupted.	Check connection between measurement head and LPM.

10. Safety

WARNING!
The user of Power/Energy measurement instruments must be trained to the use of lasers and their associated risks (ref. EN 60825). LaserPoint is in no way liable for any damage resulting from misuse, careless or use above rated limits for the instrument.



IMPORTANT: Take all the required safety procedures to work with laser beams and wear suitable protection glasses all the time!
Be extremely careful with radiation either back-reflected or back-scattered from detector surfaces, housings, mounts and stainless steel post!
Measurement heads temperatures may reach 85°C.